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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,977	09/25/2003	Russell Beavis	1062/D44	8101

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EXAMINER	
SAINT SURIN, JACQUES M	

ART UNIT	PAPER NUMBER
2856	

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/670,977	BEAVIS ET AL.	
	Examiner	Art Unit	
	Jacques M. Saint-Surin	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/14/05, 02/19/04, 02/02/04 and 09/25/03*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *02/05, 02/04, 03/0*
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. Applicant needs to update the first paragraph of the specification with respect to related applications.

Claim Objections

2. Claim 14 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-9 and 11-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Larkins et al. (US Patent 5,641,892).

Regarding claim 1, Larkins discloses an apparatus (Fig. 1 depicts an acoustically resonant system) comprising:

an acoustic source (speaker 81, as shown in Fig. 1) configured to be acoustically coupled to a variable-volume chamber (chamber 85-87) as shown in Fig. 1);

a microphone (service microphone 83 as shown in Fig. 1) configured to be acoustically coupled to the variable-volume chamber (85-87); and

a processor (controller as shown in Fig. 1) configured to receive a signal from the microphone, and further configured to determine a volume of the variable-volume chamber (85-87) based on the received signal, the processor being embedded on a printed circuit board (the controller of Larkins as shown in Fig. 1 is inherently embedded in a printed circuit board).

Regarding claim 2, Larkins shows acoustic source speaker 81 that is inherently embedded in a printed circuit board.

Regarding claim 3, Larkins shows microphone 82 that is inherently embedded on the printed circuit board.

Regarding claim 4, Larkins shows in Fig. 1 shows the printed circuit board is disposed within a housing, and wherein the printed circuit board defines a first volume and a second volume within the housing (note that microphone 83 is acoustically connected to first volume (chamber 87 and microphone 82 is acoustically connected to second volume (back chamber 86).

Regarding claims 5-6, Larkins discloses if a change in the front chamber's volume is indicated, then the controller generates a signal indicating the presence of a bubble. Preferably, this signal causes valve 6 to open, while valve 7 remains closed, and then causes the pressure source 42 to increase the pressure against the membrane to cause the IV fluid in the isolatable region 50, including the bubble 51, to be forced back to the IV source. Furthermore, If no change in the front chamber's volume is indicated, then the controller causes the valve 7 to open, so that IV fluid may be delivered to the patient. The amount that valve 7 (or another valve downstream of

the isolatable region) is opened and the amount of pressure applied by the pressure source 42 are controlled so as to control the flow rate of IV fluid to the patient, see: col. 7, lines 26).

Regarding claim 7, Larkins discloses a controller is also provided for controlling the valves, the resonance-detection means, and the pressure-changing means, and for generating a signal indicating the presence of a bubble. Preferably, the controller also includes means for determining the volume of the measurement gas in the region's first portion based on a measured resonant frequency, see: col. 1, lines 53-60.

Regarding claim 8, as discussed above, it is similar in scope with claim 1. Therefore, it is rejected for the reasons set for that claim. Furthermore, Larkins shows in Fig. 1 first microphone 83 and second microphone 82. In addition, the processor (controller of Fig. 1) inherently calculates the changes in the third volume.

Regarding claims 9, 17 and 25, Larkins discloses a printed circuit board that includes a processor (controller of Fig. 1).

Regarding claims 11, 19 and 26, Larkins shows an electrical model in Fig. 2 which indicates the inherency of the inner layer configured to pass electrical signals.

Regarding claims 12, 20 and 27, Larkins shows in Fig. 1 first microphone 83, second microphone 82 and a controller is also provided for controlling the valves, the resonance-detection means, and the pressure-changing means, and for generating a signal indicating the presence of a bubble, see; col. 1, lines 53-60.

Regarding claim 13-14, 21 and 28, Larkins discloses the back chamber's microphones 82 is used to detect the response of the system to the acoustic energy

created by the speaker 81, and the response detected by the service chamber's microphone 83 is used to calibrate continuously the speaker 81 and the back chamber's microphone 82, see: col. 3, lines 6-10).

Regarding claims 15, 22 and 29, Larkins discloses a speaker 81, preferably of the piezo-crystal type although any suitable electro-acoustical transducer may be used, to introduce acoustic energy at various frequencies into the system, see: col. 2, lines 65-67 and col. 3, line 1.

Regarding claims 16 and 24, as discussed above, they are similar in scope with claim 8 and therefore they are rejected for the reasons set forth for that claim.

Regarding claims 23 and 30, Larkins shows in Fig. 1 third volume front chamber 85, fluid filled diaphragm 50, membrane 41, valves 6 and 7.

Regarding claim 18, Larkins shows in Fig. 1 the second volume 86 is acoustically coupled to the third volume 85 by a port 84.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Larkins et al. (US Patent 5,641,892) in view of Gray et al. (US Patent 6,808,369).

Regarding claim 10, Larkins does not disclose a removable cassette. Gray discloses a disposable cassette is securely mounted onto the fluid flow control device 200, see: col. 3, lines 13-15. It would have been obvious to one having ordinary skill in the art at the time of the invention to utilize in Larkins the disposable cassette of Gray because a volume determination would be easily achieved in a well known manner.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Loedding et al. (US Patent 5,156,776) discloses an aerosol generating system.

Demers et al. (US Patent 6,321,597) discloses a system and method for measuring volume of liquid in a chamber.

Giebler (US Patent 5,811,659) discloses infusion hose for an infusion device with a bubble detector.

Dahlback et al. (US Patent 5,887,586) discloses a method and system for measuring a dose of drug inhaled.

Lloyd et al. (US Patent 5,522,385) discloses a dynamic particle size control for aerosolized drug delivery.

Koch et al. (US Patent 5,443,059) discloses an ultrasonic atomizer with a metering unit.

Lloyd et al. (US Patent 5,957,124) discloses a dynamic particle size control for aerosolized drug delivery.

Kamen et al. (US Patent 5,349,852) discloses a pump controller using acoustic spectral analysis.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacques M. Saint-Surin whose telephone number is (571) 272-2206. The examiner can normally be reached on Mondays through Fridays 10:30 A.M. -7:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272 2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jacques M. Saint-Surin
April 03, 2005

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